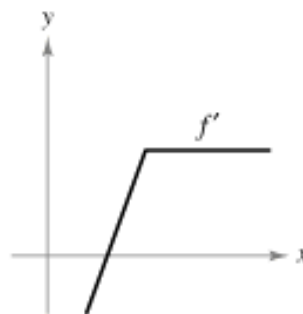
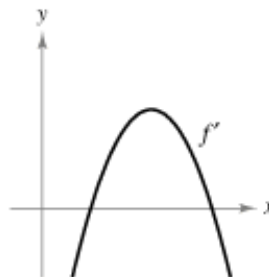


1) Use the graph of  $f'$  to sketch a graph of  $f$ .



2) Use the graph of  $f'$  to sketch a graph of  $f$ .



3) Find the indefinite integral of  $\int (2x^2 + x - 1) dx$

3) \_\_\_\_\_

4) Find the indefinite integral of  $\int \left( \frac{2}{\sqrt[3]{3x}} \right) dx$

4) \_\_\_\_\_

5) Find the indefinite integral of  $\int \left( \frac{x^3 + 1}{x^2} \right) dx$

5) \_\_\_\_\_

6) Find the indefinite integral of  $\int \left( \frac{x^3 - 2x^2 + 1}{x^2} \right) dx$  6) \_\_\_\_\_

7) Find the indefinite integral of  $\int (4x - 3 \sin x) dx$  7) \_\_\_\_\_

8) Find the indefinite integral of  $\int (5 \cos x - 2 \sec^2 x) dx$  8) \_\_\_\_\_

9) Find the particular solution of the differential equation  $f''(x) = 6(x - 1)$  whose graph passes through the point  $(2, 1)$  and is tangent to the line  $3x - y - 5 = 0$  at that point.

9) \_\_\_\_\_

10) A ball is thrown vertically upward from ground level with an initial velocity of 96 feet per second. Using Calculus, find the following:

a) How long will it take the ball to rise to its maximum? 10a) \_\_\_\_\_

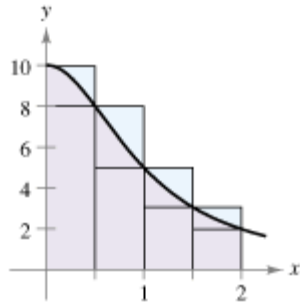
b) What is the maximum height? 10b) \_\_\_\_\_

c) When is the velocity of the ball one-half the initial velocity?  
10c) \_\_\_\_\_

d) What is the height of the ball when its velocity is one-half the initial velocity?  
10d) \_\_\_\_\_

11) Use the upper and lower sums to approximate the area of the region using the indicated number of subintervals of equal width.

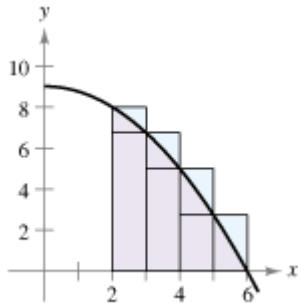
a)  $y = \frac{10}{x^2 + 1}$



11a) Upper Sum \_\_\_\_\_

Lower Sum \_\_\_\_\_

b)  $y = 9 - \frac{1}{4}x^2$

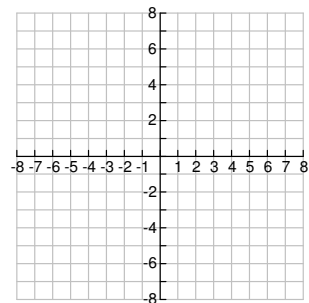


11b) Upper Sum \_\_\_\_\_

Lower Sum \_\_\_\_\_

12) Use the limit process to find the area of the region between the graph of the function and the x-axis over the indicated interval. Sketch the region.

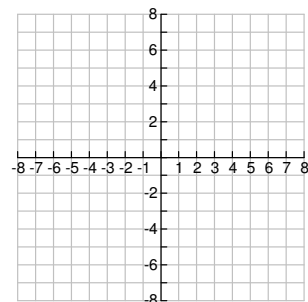
$y = 6 - x$        $[0, 4]$



12) \_\_\_\_\_

13) Use the limit process to find the area of the region between the graph of the function and the x-axis over the indicated interval. Sketch the region.

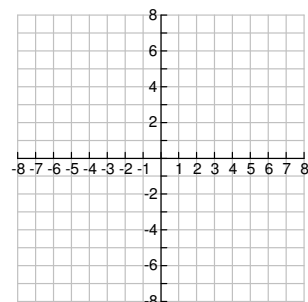
$$y = x^2 + 3 \quad [0, 2]$$



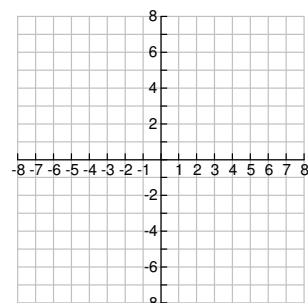
13) \_\_\_\_\_

14) Sketch the region whose area is given by the definite integral. Then use a geometry formula to evaluate the integral.

a)  $\int_0^5 (5 - |x - 5|) dx =$  \_\_\_\_\_



b)  $\int_{-4}^4 \sqrt{16 - x^2} dx =$  \_\_\_\_\_



15) If  $\int_2^6 f(x) dx = 10$  and  $\int_2^6 g(x) dx = 3$ , find

a)  $\int_2^6 [f(x) + g(x)] dx$

15a) \_\_\_\_\_

b)  $\int_2^6 [f(x) - g(x)] dx$

15b) \_\_\_\_\_

c)  $\int_2^6 [2f(x) - 3g(x)] dx$

15c) \_\_\_\_\_

d)  $\int_2^6 5f(x) dx$

15d) \_\_\_\_\_

16) If  $\int_0^3 f(x) dx = 4$  and  $\int_3^6 f(x) dx = -1$ , find

a)  $\int_0^6 f(x) dx$

16a) \_\_\_\_\_

b)  $\int_6^3 f(x) dx$

16b) \_\_\_\_\_

c)  $\int_4^4 f(x) dx$

16c) \_\_\_\_\_

d)  $\int_3^6 -10f(x) dx$

16d) \_\_\_\_\_

17) Find the particular solution of the differential equation  $f'(x) = -2x$  whose graph passes through the point  $(-1, 1)$ .

17) \_\_\_\_\_

18) The speed of a car traveling in a straight line is reduced from 45 to 30 miles per hour in a distance of 264 feet. (Hint: change mph to feet/sec)

a) Assuming constant deceleration, how far (in feet) has the car moved when it has been brought to rest?

18a) \_\_\_\_\_

b) Find the distance (in feet) in which the car can be brought to rest from 30 miles per hour, assuming the same constant deceleration.

18b) \_\_\_\_\_